

## REMARKS

Reconsideration and allowance of this application are respectfully requested in light of the above amendments and the following remarks.

Claims 9-25 have been canceled in favor of new claims 26-44. Support for the subject matter of the new claims is provided for example in the original claims, Figs. 4, 5, 9-11, 13, 29-34, 49 and 50, and the descriptions of these figures in the specification. (It should be noted that references herein to the specification and drawings are for illustrative purposes only and are not intended to limit the scope of the invention to the referenced embodiments.)

Claims 9-11, 13, and 15-25 were rejected, under 35 USC §103(a), as being unpatentable over Bjerke et al. (US 2007/0064831) in view of Belotserkovsky et al. (US 6,650,617). Claims 12 and 14 were rejected, under 35 USC §103(a), as being unpatentable over (US 2007/0064831) in view of Belotserkovsky et al. (US 6,650,617) and Medlock et al. (US 7,233,810). To the extent these rejections may be deemed applicable to new claims 26-44, the Applicants respectfully traverse based on the points set forth below.

Claim 26 defines a transmitting apparatus: (1) that includes a first modulation mapping mode that maps a first transmission data sequence to a signal point position employing the same modulation mapping rule applied to a second transmission data sequence; (2) that includes a second modulation mapping mode of mapping the first transmission data sequence to a signal point position rotated a predetermined amount from the signal point of the mapping rule applied to the second transmission data sequence; (3) that maps identical data of the first transmission sequence employing the first and second modulation mapping modes; and (3) that selectively outputs a modulated signal of the identical data obtained by employing the first and second mapping modes. The claimed subject matter provides an advantage of improving the error rate

characteristics of communicated data by communicating identical data employing two symbols whose phases are rotated with respect to one another within a time or frequency multiplexed transmission signal (see the original specification, paragraph bridging pages 5 and 6).

Stated more simply, the claimed subject matter creates two symbols from identical data such that the two symbols have phase rotated signal point positions with respect to one another. In an exemplary, non-limiting, embodiment of the invention illustrated by Figs. 11A and 11C, the four symbols of the constellation pattern illustrated by Fig. 11C have a 45 degree phase rotation with respect to the four symbols of the constellation pattern illustrated by Fig. 11A; thus, for identical data applied to the mapping schemes of Figs. 11A and 11C, any symbol generated employing the mapping scheme of Fig. 11C has a 45 degree offset from the symbol created by the mapping scheme of Fig. 11A. Additionally, the claimed subject matter operates to time or frequency multiplex the two phase-differing symbols.

It is noted that Bjerke discloses OFDM communication in which each of a plurality of baseband symbols is mapped by an IFFT 224 to a distinct OFDM subcarrier for simultaneous transmission (see Bjerke paragraph [0039]). It is submitted that Bjerke's IFFT 224 does not rotate signal points of one constellation pattern with respect to another, as proposed in the Office Action (see Office Action page 3, lines 11-14); instead, Bjerke's IFFT 224 shifts the center frequency of each symbol, received from symbol mapper 222a, from baseband frequency (i.e., zero Hertz) to a subcarrier frequency of the OFDM signal.

Thus, it is submitted that Bjerke does not disclose the Applicants' claimed subject matter of creating two symbols from identical data such that the two symbols have phase rotated signal point positions with respect to one another. And because Bjerke does not disclose creating two symbols, from identical data, having phase rotated signal point positions, it necessarily follows

that Bjerke cannot be considered as disclosing the Applicants' claimed subject matter of time or frequency multiplexing such symbols.

It is noted that Belotserkovsky discloses adjusting the phase of equalizer taps so as to synchronize the phase of a reception FFT window with the phase of a received signal (see Belotserkovsky col. 4, lines 34-44). It is submitted that Belotserkovsky does not supplement the teachings of Bjerke with respect to the Applicants' claimed subject matter.

It is noted that Medlock discloses rotating a constellation pattern by 45 degrees (see Medlock col. 19, lines 6-8) but does not disclose the Applicants' claimed subject matter of creating two symbols from identical data, such that the two symbols have phase rotated signal point positions with respect to one another, and time or frequency multiplexing the two symbols.

Accordingly, the Applicants respectfully submit that the teachings of Bjerke, Belotserkovsky and Medlock, considered individually or in combination, do not render obvious the subject matter defined by Applicants' claim 26. Independent claims 28, 34, and 37 similarly recite the above-mentioned subject matter distinguishing apparatus claim 26 from the applied references, but claims 34 and 37 do so with respect to methods.

Therefore, allowance of claims 26, 28, 34, and 37 and all claims dependent therefrom is considered to be warranted.

Independent claim 42 defines a transmitting apparatus that selects, on a predetermined basis, a particular symbol within a constellation pattern to represent data. In an exemplary, non-limiting, embodiment of the invention illustrated by Figs. 11A and 11B, two data bits (i.e., 0,0) may be represented by a symbol having positive I and Q components or by a symbol having a negative I component and a positive Q component, in accordance with a predetermined basis for selecting the symbol to represent these bits. The claimed subject matter provides an advantage

of improving communication error rate performance by communicating identical data employing different symbols (see specification page 13, lines 18-25).

Each of Bjerke, Belotserkovsky, and Medlock fails to disclose the Applicants' claimed subject matter of representing, on a predetermined basis, the same data with different symbols of a constellation pattern.

Accordingly, the Applicants submit that the teachings of Bjerke, Belotserkovsky and Medlock, considered individually or in combination, do not render obvious the subject matter defined by claim 42. Therefore, allowance of claim 42 and all claims dependent therefrom is warranted.

In view of the above, it is submitted that this application is in condition for allowance and a notice to that effect is respectfully solicited.

If any issues remain which may best be resolved through a telephone communication, the examiner is requested to telephone the undersigned at the local Washington, D.C. telephone number listed below.

Respectfully submitted,

/James Edward Ledbetter/

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JEL/DWW/att  
Attorney Docket No. 009289-05197  
Dickinson Wright PLLC  
1875 Eye Street, NW, Suite 1200  
Washington, DC 20006  
Telephone: (202) 659-6966  
Facsimile: (202) 659-1559

James E. Ledbetter  
Registration No. 28,732